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NOTES ON URBAN WARFARE

S. L. A. Marshall

Army Material Systems Analysis Agency
Aberdeen Proving Ground, Maryland

April 1973

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ABERDEEN PROVING GROUND, MARYLAND

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We run into a curious void in the literature of warfare. Those practitioners of the art who were also its ablest theorists, scholars and writers dwelt on its varied aspects to the limit of their imaginations. One thing, however, they did not touch upon -- combat where life is centered. Run through the list of writers and their works -- Frederick, de Saxe, Clausewitz, Jomini, Kuropatkin, Bernhardt, Henderson, Foch, Fuller, Hart, et al. Not one has anything to say about military operations within or against the city. Either the subject was too sticky, too little understood, or it was dismissed as unimportant. Thus there is no foundation from which to build. Yet city fighting is not a phenomenon peculiar to our time though an Army that twice had to attack Seoul and once defend it, and later had to defend Saigon numerous times must be aware that it is a reality and that its nature and methodology require study. This report is only a start toward that end and its one object is not to define but to stimulate thought.

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NOTES ON URBAN WARFARE

1. PROBLEM AND DECISION

In looking at the problem of urban warfare in the future there is no choice other than to guide on the past.

Once the historical approach is accepted, it quickly becomes self-evident that the problem is as old as war itself and the objective should be to concentrate on how new weapons and armaments, or those that may be conceived and developed, will influence fighting operations in built-up areas.

That term is advisedly used primarily because "urban" is a limiting word. The same considerations govern the choice when decision must be made as to whether a small village or town must be attacked (or defended), or on the other hand bypassed or yielded, as when the object or obstacle is a metropolitan complex. The principles of war apply no less directly whether the structured area is large or small. Decision turns not on what possession of the village or city means intrinsically, but on what is likely to follow if it is not possessed and under control.

There are certain marginal exceptions. The overall affect on mobility, logistics, etc., is of lesser consideration when the area is needed for cover against inclement weather or heavy bombardment, or when its loss or winning has a transcendent psychological or political value. That may happen when the tactical importance of the area has either diminished or was of little consequence to begin.

The scope and complexity of the problem are best understood by factoring and analyzing all that bears upon the making of command decision. Nonetheless, tactical decision being a narrow and usually local aspect of operations, it is misleading except as it becomes related to the higher conduct of war. Fighting operations, when most soundly and economically directed, are an attack on the enemy's lines of communication, rather than on his living mass, military and civilian, the main object in war being to bring about peace. The most direct route to that end is to deny the enemy the energy to move offensively. When his energy sources are blocked out, or his supply forwarding apparatus becomes impaired, he is more quickly finished and there is less destruction of people and property.

This is nothing new in warfare. Commanders understood it in Biblical times, as did the leaders of "barbarian" armies during the Dark Ages. Jericho and Megiddo have the same grand tactical significance today as when armies used spears, slings and chariots: they are interdictory points on main supply routes.

Geography itself dictates the main avenues of military movement which are congruent with the paths by which civilization has itself advanced. Nations, not unlike commerce and the spreading of population, grow and strengthen primarily out of ocean port facilities. Within the interiors, main cities and towns arise and flourish out of proximity to water courses. Lines of communication build up in the same way.

Elementary though this be, for the purpose at hand it needs once again to be stressed what history and economic geography should make substantially clear -- that man, like a running stream, advances mainly by taking the path of least resistance. So it is with armies.

Precisely the same roads of ingress that were used by the conquerors of antiquity to invade Europe -- for example, the valleys of the Vardar, Maritza, Danube and Rhone -- were used again by invading forces in the two world wars. Being the easiest and most natural routes, they were also the lines along which human habitations, some large, some small, had come to cluster.

What were once only trails became roads, then highways. With the coming of the railroad age, the tracks generally followed where initially foot travelers had set the course. In modern times, as when the Roman Legions invaded Gaul and what is now Germany, the nodal points of advance were the built-up areas. When there was none such on ground that Roman generals rated a strategic point, there was a founding. So Cologne got its name because it was a Roman "colony."

Within the Nineteenth Century in Europe, there came about main dependence on rail systems for the movement of goods and people. That development made possible -- and in fact precipitated -- the rise of mass armies, for it radically expanded the size of troop concentrations that could quickly be moved to the frontier upon mobilization. Rail centers and railhead towns thereby doubled their attractiveness as military objectives, for in the usual case, due to the controlling geographical factors, they were already the hubs of a roadway network.

2. THE WORLD WAR I PICTURE

From the opening of World War I, the importance of the city as a pivotal conquest in war, due to what it signified as a communications plus or minus, was more heavily dramatized than ever before. The Germans had to have Liege, not because the Belgians manning its frowning forts were too formidable a force to be left on the rear, but to secure for the army of the right flank, that was pre-designated to deliver the decisive blow to France, relative freedom of movement along the immediate lines of communication beyond.

After Liege, the advance of that army, like the resistance to it, is marked by the struggle to possess, or retain, built-up areas -- meaning communications centers, or cities and towns. There was relatively little fighting in open country. The main battle sites have names where civilians massed to earn a livelihood, such as Mons, Le Cateau and Maubeuge. Attack-in-main came where resistance centered and armies stood to defend where failing so to do meant yielding to the enemy the lines of communication to the east and south,

And that is pretty much the story of the ebb and flow of operations through World War I. There are some exceptions, such as the battle of the Masurian Lakes and the First Battle of the Marne, both fought in open country. But in the Masurian Lakes the Germans went on the counter-offensive before the Russians could get a communications hub within reach, and at the Marne the Germans were striking for Paris, which was the nerve center and communications hub of France. Verdun, though significant as a formidable battlement and nigh a holy place to Frenchmen, was particularly a military prize due to the communications just outside. Three great battles were fought for possession of Ypres. The shattered city of itself had little value. But it controlled the network of roads to the Channel coast. Losing it, the allies would have had their left flank turned. Collapse and perhaps final defeat could have resulted.

The common denominators of the opening battles in which the German First Army drove the French Fifth Army and the British Expeditionary Force from Belgium to the Marne tells the story. With few exceptions they have this common pattern: the defenders used such outer-urban cover as was available -- houses, slag piles, city dumps, hasty rifle pits along road shoulders and the paralleling ditches. The stand was usually aborted by an out-flanking movement, at which point the defenders retired to cover their lines of communications, so that there was relatively little skirmishing and fire exchange within the built-up area. Possession of the city or town was nonetheless the decisive object of the local engagement.

On the Eastern Front the greatest battles developed out of the struggles to possess a major communications and supply center. Names such as Lvov, Krakow, Warsaw and Przmysl stand out prominently. When the Allies made their ill-fated move at Gallipoli, the goal was Constantinople, the nodal of communications in four directions.

No main offensive staged in the west during four years of fighting in World War I succeeded that had as its grand object the decisive rupturing of the opposing line. Artois, the Somme, the Aisne in 1917 and the German Michel offensive in 1918 are remembered mainly as tragically costly failures. When in the last five months the war turned fully mobile again, the Allied offensive rolled from one pivotal communications hub to another, and with few exceptions, the battles

were named for cities and towns, such as Soissons, Chateau Thierry, Le Hamel and Amiens. Close-quarter fighting in built-up areas characterized the period, though it was mainly catch-as-catch-can, the soldiers in the attack having no special training in house-to-house warfare.

A city, town or village in open warfare is both a block and an open door, a stone in one's path or a handhold on success.

3. THE WORLD WAR II PICTURE

The greatly expanded role for armor that developed between wars, the innovation of the vertical airborne assault, and other gifts to the new mobility, such as the triangulating of the division and the introduction of self-propelled guns, changed none of this fundamentally.

The built-up area did, however, acutely influence and limit armored operations. The walled streets having the nature of defiles, the city or town took on a fortress aspect as to the employment of the tank. Where there was lacking sufficient infantry to close and assault house by house, the question always arose whether the soundest tactical alternative was to assault at large risk, pull up and lay siege or bypass. The answer would depend on many variables, such as the size and armament of the defending garrison, whether there was armored force at its disposal, the availability of parallel lines of communication for the use of the motorized elements that followed the armor and the importance of the city or town as an operating hub.

There was far more urban warfare -- that is, block-by-block fighting -- in the second world war than in the first. More than all else, the preponderant role of armor was responsible for the change, though there were other factors, such as the overall motorization of operations and the other modern technologies. Virtually all communicating had become electrified. Without POL, military forces became immobilized. Oil pipelines followed up the advance of armies. Possession of the city or town became more vital because there the facilities were present. Main bases and forward bases became placed where the rails, highways and information installations could best serve, with least waste of time and money, the progress of operations. In sum, the city and town, and the possession thereof, were more than ever before, the linchpins of military success.

Little, if any of this, was seen in the first years of the war when German military power seemed omnipotent in western Europe. The Stuka dive bomber and the panzer power of the Germans blinded eyes to all else. The armored spearheads made their decisive sweeps through open country. There was little fighting for the towns and cities as such: either the armor circled them and went on, or the demoralized defenders withdrew lest they be enveloped. The Battle of France was a rout, not a meaningful contest from which the new face

of war emerges. The same must be said about the German campaigns in Poland, Norway and the Balkans. Opposed, they were still too little opposed to confirm any new pattern or to supply a key to the possibilities of future war. Not until Operation Barbarossa, the invasion of the Soviet Union, does the picture begin to unfold. There the fighting pivoted from town to town and city to city, the significance being that victories won in open country are in the end of phyrrie consequence. Such place names as Smolensk, Kiev, Moscow, Stalingrad, Leningrad and Sebastopol come to mind, and in certain of these, it was truly urban warfare, at close quarters and block by block, with armor playing little part in the decisive crunch between foot forces, though it could later exploit the outcome spectacularly and sometimes decisively.

The defense of the USSR was built around cities and towns. That is where the armored hedgehogs were rightly placed. And it was not chiefly because the Red Army sought protection from the winter's cold, while denying it to the enemy. That was just one more advantage.

We come now to the invasion of Normandy. The troops landed on Utah and Omaha Beach and dropped, (mainly misdropped) along the Cotentin Peninsula, had as their main objective the ultimate capture of Cherbourg. The object was so that the port facilities could be utilized and the incoming supply would energize the expeditionary force. As it turned out, the Germans had done such a good job of sabotaging the installations that six months after its capture had to pass in clearing operations before the port could be opened, the invading force meanwhile being sustained by across-the-beach supply.

Even so, every water-borne tactical unit in the Normandy attack had as its primary object, either the capture, or supporting the capture, of a village or town inland. They were heading for such places as St. Laurent, Colleville, Vierville and Varreville, for these were the nodals of high ground defense beyond the beach. Observation, the fact that the village church steeple was still standing, the further fact that the stone-walled perimeter could be covered by very few men, while support from the village center could be rushed to whatever quadrant was threatened, -- these things determined the fire fight locus. In extremity, when withdrawal became necessary, the defenders could move under cover of the hedgerows and sunken roads radiating from the built-up area. Thus the struggle took shape and was decided in and around the line of coastal villages after the landings were made.

There is little change in the scenario, as to how the airborne operated and how the ground was consolidated. Their objectives were places like Ste-Mere-Eglise, Ste-Come-du-Mont, Pouppeville, Neuville-au-Plain and the massive stone-walled farm complex that covered the crossing of the Merderet River at La Fiere: and just beyond that tier lay Carentan, Montebourg, Valognes and other more critical traffic and supply control points.

German resistance, of a much larger scale, built up around these same centers as it did later around Caen and St. Lo, rather than in open country. The war became a fight for built-up areas more than for high ground, or commanding fire positions. That was true from the start, despite the tediously slow going and the difficulty of deployment in the Normandy bocage. The much greater overall mobility still altered the face of tactics. The controlling terrain features were the highways, rails and water courses over which people and their products could be moved; high ground less influenced the pattern of maneuver than did a road intersection.

4. THE AFTERMATH

Following the drive to free Cherbourg while continuing the Normandy mopup, there was the Brittany campaign to free the port city of Brest and possibly open a new port facility at Kiberon Bay. It was a protracted, costly and highly wasteful military enterprise, with more fort-to-fort (these were old Napoleonic works) fighting than skirmishing in the built-up areas. The Germans capitulated only when Montbarrey, the last outguarding fort at the edge of the city, was taken by storm. The little house-to-house skirmishing that took place therefore did not influence the course of the battle. But while U.S. VIII Corps had been moving on Brest, the enemy had been mining the harbor waters, demolishing all major port facilities such as piers and warehouses and systematically torching or dynamiting block by block the stores and habitations of the people of Brest. The city was a ruin and the harbor was for the duration without any military value.

The hard-won object was therefore no prize to its captors. Had this denouement been foreseeable prior to the right wheel into Brittany, the strategy would have been well advised to leave the area alone and seal off the peninsula with strongly manned, tank-killing roadblocks, as was done with St. Nazaire and some of the Channel ports that were only semi-invested.

Eight days after the siege of Brest ended, Paris was liberated by a two-division entry into the city. The van of U.S. Third Army had bypassed it earlier, for while it was still captive to a garrison of somewhat less than 10,000 Germans, that force was no threat to the Army's flanks and entering upon Paris would have greatly slowed Third Army's advance. Such house-to-house fighting as took place during the liberation was a matter of tanks and halftracks squaring off in the avenues and shooting up apartment houses and other real estate from which fire had been reported.

One week after the entry into Paris, on September 2, British forces liberated Antwerp, having for the time bypassed and sealed off Le Havre. The Antwerp takeover was hardly a capture. There was so

little resistance that a U.S. transportation officer was surveying the port facilities by evening of the first day. He found them virtually intact, though still not to be used. The Germans, by then in general retreat and disarray, had reckoned that the forces present were unequal to staging a defense around the Antwerp perimeter and had opted to block off its water approaches from the sea, thus denying its use as an ocean port. The westward projection of islands and peninsulas flanking the estuary made that a sound strategy. In this case, the channel, not the city, was the greater prize. This, they were able to fire blockade for the greater part of the next two months, thus withholding from the Allies critical supply, such as ammo and fuel, along with winter clothing, as Hitler's armies in the west moved and marshaled for the Battle of the Ardennes.

In the same hour in which the siege of Brest was ended, Allied forces made their gambling try to leapfrog the enemy MLR in Holland and probably bring a quick ending to the war. It was the operation called Market-Garden and sometimes referred to as the Battle of Arnhem, which city was but one of its sectors. The main forces of the attack were the First Allied Airborne Army and British XXX Corps. The design called for synchronizing the vertical assault and an overland thrust heavy in armor along an extremely narrow salient. The air drop and the thrust by highway had the same axis. The task of the airborne was to secure the main cities, towns and bridges along the route and hold until the tank columns came up.

In the end the operation was strategically a failure marked by numerous dramatic and brilliant tactical achievements, but also marred by some incredible stupidities on the same plane. They are less to be blamed than was the master plan, which had one fundamental and hardly pardonable fault: it did not allow sufficient margin for error.

The capture and control of overland routes had to be within about 15 percent of what the planners projected -- and this within the first 48 hours -- or the prospect was that the operation would fall short of the grand object, the city of Arnhem, on the far bank of the Neder Rijn, the last great water barrier. Though 15 percent is much too thin a planning figure, due to an air of excessive optimism at headquarters of British 21st Army Group the risk of failure was not taken too seriously.

Pertinent to the purpose at hand, however, is not the story of failure but the fact that as to both airborne and armored operations, the plan promised the capture, control and utilization of one city or town after another -- Eindhoven, Best, Grave, Groesbeek, Hertogenbosch, Nijmegen and so on. It had to be that way because that's how the roads

run, and where the energy and support centers lay as well as the strong points of resistance. There could be no bypassing of the latter without slowing the movement and jeopardizing the operation as a whole, and in some instances there was no option whatever, due to lack of any alternative route along the same general axis. Once the wheels got in motion, it was pretty much a case of trying to stay mobile while inside a straitjacket. The cities were not communications hubs; they were call stations along one general route. There was just no way around. And the enemy based his fighting strength within the built-up areas.

The German offensive into the Ardennes in December of that year offers nothing in contrast to the controlling considerations already cited. Main forces had to keep to main roads owing to the ruggedness of the well forested countryside, and keeping to the main roads he had to fight main battles for main towns. When a major highway hub was bypassed, as at Bastogne, which decision incidentally derived from wholly freak and misleading circumstances, the friction upon operations multiplied far beyond expectation, and energy rapidly gave out. On the other hand, when the Germans opted to attack head-on such a center, as happened at St. Vith, the attrition and even more so the time gained by the defenders, made nugatory the mere winning of ground as of the shattered town.

5. DIRECTIONS AND DECISIONS

These few quite casually interwoven strands drawn from the nigh limitless canvases that were World Wars I and II should provide some guidance to the factors in decision making in the problem under study.

Certain generalization are relatively safe. The attack on a built-up area, be it hamlet or city-size, is never loosed simply because the object is there. Battle is always destructive and assault on an unarmed people is no more justifiable militarily than legally; in the tactical sense it is more counterproductive than the shootup of an undefended mountainside. Whatever can be contrived without fire is best done that way, whether in enemy country or in traversing a friendly or neutral zone. The irony is that this rule has been violated as often in the air age as in the time of the Goths and Vandals who did sometimes spare cities.

Obviously, the options differ radically when the object is a coastal built-up area rather than a town or city of the interior. The ocean port does not have radial lines of communication. It may, as in the case of Cherbourg and Brest, have lines to the interior in only one general direction. If its supply-support facilities clearly are not needed to energize future operations, it is better bypassed and heavily outguarded. The tactical rule applies, however, only when the geographic-demographic situation is such that the isolating and penning of hostile

force can be made reasonably certain through the use of air power to irrupt the sensitive points within the confined area.

Where built-up areas of the interior are concerned, the decision -- whether to attack, lay siege or bypass -- turns little or none on the size of the populated object. If the city, town or hamlet is a main and armed block along the path of advance, the considerations are the same, whatever the structural expanse. Where the block is absolute, in that the position cannot be turned by major battle elements, the ground is almost invariably such that there is available cover such as forest and high ground, affording hull-defilade-positions, along the approaches and to the flanks. Softening of the position through bombardment by tracked guns, armor and other highly mobile elements then becomes the first order in the attack, which preliminary pressure may prove to be aborting.

If it is not such a block -- armed, resistant and unflankable -- it is not a military target and its harassment or investment is wasteful of time and materiel, and technically a war crime.

When a defended built-up area is strong in artillery, and contains some armor, but is apparently weak in deployable foot force, it is better bypassed, provided the routes paralleling the MSR are serviceable to heavy traffic. The defending heavy weapons, thus being without tactical balance, are not a ponderable threat to the main body of the attack. Situationally, the defending armored forces do definitely have the advantage of interior lines, being at the hub of the highway net. But it is better to risk the battle in the open, after drawing them from cover, than to attempt engaging them in the structured area where they are protectively placed and in position to fire along the main avenues of ingress.

To reverse the proposition, a decision to defend under these conditions, even as a delaying action, is seldom tactically sound. The likely end is the squeezing-out or elimination of the garrison.

Envelopment, when the built-up area is relatively small and the forces in the attack move mainly under armor plate protection, is the most effective and least costly form of attack. Under those conditions, its menace becomes fully felt. That it was thwarted at Bastogne is not highly significant. The failure came because of an initial misestimate of situation by the attacking German XXXVII Panzer Corps. Its commander believed that the U.S. garrison defending was heavy with gun power and ammunition. Consequently, instead of massing his artillery to begin, he routed most of his batteries around Bastogne to continue the march westward. It is with artillery mainly that resistance out of urban areas is tranquilized.

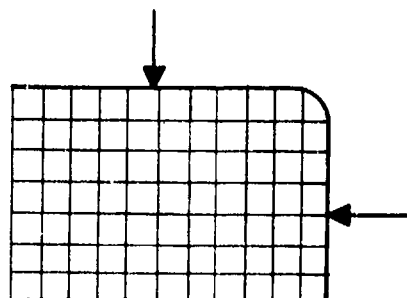
Against the massiveness of a truly metropolitan complex, attempts to prevail through envelopment only, though they are combined with artillery bombardment, are most apt to be futile, wasteful and immobilizing to the forces of the attack. That is, when the city is defended by relatively mobile foot forces and antiarmor weapons, in sufficient numbers to cover the main approaches. It seemed to work at Kiev, though there the defense was badly misdirected. It failed decisively at Stalingrad, though had the Germans moved promptly when they drew up to the banks of the Volga, it might have worked.

The alternatives to envelopment -- or more correctly, its probable derivatives out of the appearance of failure -- are protracted siege or direct assault, usually in the form of a minor tactical impingement that is thereafter expanded house to house and block by block. Sounding equally formidable, they are likely to work out equally sterile, provided the wrong choice is made. The choice itself should be determined by the governing conditions -- weather, the footing, terrain, the availability of forces, the weapons mix, the pressure of the timetable, etc.

Heavy air bombardment toward softening the target is one of the most dubious of expedients, tactically and as to the energizing of future operations. The main question is practical rather than moral. Even as the structured city presents the face of a fortress to attacking armor, the rubble city becomes one great mantrap to deployed infantry. Troops may advance afoot only in small packets, and where the defiles are tightest, may go forward only one man at a time. Close support by armor, or putting the tanks forward of the infantry to break the way and shield, is rarely possible. The APCs have to be left behind. All the signs and guideposts are down and city maps are of no help. Street lines and passageways are erupted by piles of debris, broken walls of masonry and twisted metal. It is easy to get lost. Strong points of resistance and defense citadels and sensitive points, such as command posts and supply dumps, are difficult to identify and more difficult to take or to eliminate. The underground billets of the defenders are passed by unseen and weapons positions are easily concealed. As imagination takes over, the danger at one's back seems greater than the danger that probably lies forward. Maintaining friendly contact comes as hard as locating enemy points of resistance. So stress-laden is the task that the forward tactical elements must be frequently shifted with the frontal fire teams rotating hourly or so. Such duty is more wearing on the individual foot fighter than being under heavy sustained fire as one of a company.

When the built-up area stands firm and relatively intact, however, and the main obstacle to advance is the defensive fires, penetration is best achieved by a converging two-pronged attack against one quadrant of the structured mass as shown in the following diagram.

Figure 1



The attacks should be synchronized. The choice for the attack against the flank is according to the variables hitherto set forth -- which approach is best protected for the hitting force, what ground is most favorable for the supporting artillery, etc. The maneuver is initially a feeling out and has the advantage that it does not risk a heavily compromising involvement to begin. The twin objectives are to achieve tactical control of the quadrant under direct assault and, if possible, to bring the defending garrison to full battle in the open to relieve the pressure.

When lodgment is affected front and flank, the force buildup (largely infantry, but with tank-killing weapons) begins in the immediate environment. The probable locale is a residential area in the outskirts or walled farm houses. The next object is to set up a fire base; the materiel for defensive protection (wire, mines, etc.) should already be coming forward. The step-by-step penetration of the city along the converging axes does not begin until the two bases are firm. Once it is underway, and as it progresses, the main body gains greater freedom of movement and the command must judge of the critical hour when an armored sweep across the enemy rear may change the character of the battle.

The premise here is that if forces of the attack cannot reduce resistance and gain control over a quadrant of the city, they cannot overcome the whole. Should they gain the quadrant, on the other hand, the defense is already half unhinged, since the opposite quadrant then becomes vulnerable from two sides. Furthermore, the nature and substance of the defense, and the countering tactics, become explored and understood in consolidating the hold over the quadrant; then the next stage of the battle should be better systematized.

The nature of built-up areas, other than when they are defended by perimeter, also harshly limits the numbers of men and weapons that the defense may array at any one point. Under optimum circumstances the fire line could hardly be more than the width of an avenue or the length of a city block. Though the garrison is on interior lines, there is the offsetting disadvantage that its fire brigades must be prepared to operate over 360 degrees, and once the fighting is confined to the city streets, the defender has no advantage in observation.

The whole of such operations depends as much on economy of force as on numerical and weapons strength, which is to say, it depends on using just sufficient force for each stage of the operation, so that a ready and alerted reserve body can be held in hand until the enemy falls into a trap or commits himself to a definite course of action. Since the armor of the attack will not be used early during the fighting for the city interior, other than as transport for the infantry to its LD from which the penetration proper begins, its main function is to encounter and destroy or turn back reenforcement and resupply to the garrison.

The most sensitive point in any urban complex is its water supply system, and second to that, its electrical supply system. This holds true in peace or war. The plants are often located in the environs or the nearby countryside as are the reservoirs, intake points, power lines, etc. Their dismantling, or interruption, where they can be seized before the city is attacked or invested, almost needless to say, is of first priority, ahead of the capture and securing of the regional air terminal or strip.

When to destroy, as against attempting to garrison and hold flankward and rearward bridges and their approaches, is always a moot question, to be answered out of situational development. When, however, the forces of the attack are clearly in superior strength to those of the immediate and active defense, the preferred risk is their seizure and preservation, fixing them with demolitions if they are not already so prepared. The holding policy continues until the hour when unmistakably superior enemy reserves are upcoming.

6. LOGISTICAL CONSIDERATIONS

Night attack on such a target area as is under discussion is rarely a worthwhile venture. It cannot be concealed due to noise. The great liability is not that the dark makes the attack force more vulnerable to defensive fires, for obviously the advantage is the other way. Accurate and steady ranging-in on moving vehicles during darkness is next to impossible. The main danger lies in getting lost, then having to withdraw uncoordinated; or wandering into anti-vehicle obstacles -- tank ditches, mine belts and fields of wire. The task of extrication may then bring on a main battle not wanted, when all things become hastily improvised.

If such night operations are to be carried out, however, their chance for success lies in painstaking reconnaissance during daylight hours, which also engages hazard and special difficulty. Should the intervening countryside be broken with wood patches, hedges, winding roads, streams, ponds and farm plots, air obliques thereof are not sufficient for night guidance. The pilot driver cannot follow a zigzag course at night, charted according to estimated distances only, and bending around physical features that he has not seen and cannot imagine. Only the use of lights would enable him to move with certainty from point to point, and that would be prohibited. There are alternatives such as taping the course with luminous material in advance of movement, the latter being staged most advantageously in the predawn hours.

Conditions of low visibility, on the other hand, may offer the most favorable opportunity, particularly if the other meteorological conditions, especially wind direction, are right. In the optimum situation, the van of the attacking column should be preceded at tactical distance by smoke-laying armored vehicles that can maintain a screening of the force up to the line where the infantry element unloads, scrambles, and takes up ground. Tactical distance varies according to wind direction and volume and the effectiveness of the chemical agent.

If there is not such a vehicle on inventory or in development, it is needed for this and other battle purposes. It should be heavy enough in frontal plate to be unstoppable up to 600 meters by a three-inch shell. The projection of the chemical should be sideways with the screen-laying machines advancing in echelon to give the smokescreen body and continuity. The most forward projector in that way covers the vehicle to its flank-rear and so on. The vehicle must be highly maneuverable. Of armament, it needs only a light machine gun for local security. Its primary, in fact, its whole function is smoke-laying. Putting smoke projectors on fighting armor will not do it. Smoke screening is a specialist's task.

7. THE TACTICAL PATTERN

The scheme of maneuver earlier diagrammed is equally applicable to the initiation of attack upon a defended city or the clearing of an enemy-held village. It best insures success, with minimum risk of such involvement in depth as to compromise the main body by bringing on a battle to achieve extrication. In sum, it does not make disengagement prohibitively costly. Should withdrawal become necessary, the principles remain the same. Again, the mobile, armored elements cover the retirement. When a position has to be evacuated, the best time to do so is obviously during the night.

As to forces committed to the interior fighting, the rule as elsewhere in field operations is to make the maximum use of cover, expose only when essential, and present the smallest target possible.

The mission of the elements deploying into the built-up area is in a sense threefold:

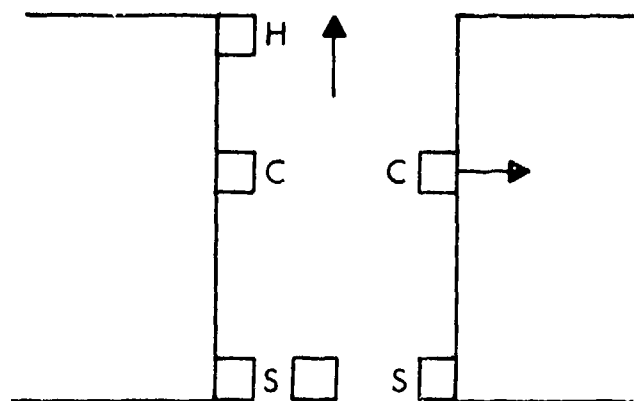
- a. hitting and guarding at the point,
- b. flankward search, clearing and neutralization, and
- c. support, supply and rearward security.

This alludes strictly to the tactical elements and assumes the working of a logistical chain connecting the fighting force with the supply and reenforcement resources of the rear. That apparatus takes shape as the operation develops and gives it some hold on security, just as the heavy fighting weapons have no place in the foreground until they can base close-up with relative safety.

To be envisaged then is a tactical formation proceeding in three waves, or echelons, mutually supporting, and to a degree interchangeable, as exertion brings on fatigue or losses necessitate replacement. Depending on the circumstances -- the measure of resistance expected, the nature of the area to be covered, or even the width of its average street -- the smallest deployed unit might be either a squad or a fire team. The distribution of the formation would be similar to that depicted in Figure 2. Unit H is the forward hitting and guarding element. Units C are the search and clearing parties operating to the flanks. Units S are the supply and support echelon. Each of these has a separate and distinct function, though they are interrelated and contribute equally to the success of the mission as a whole. To be emphasized above all else is that infantry in the attack must travel light. To overload it is to invite defeat. Nimbleness of foot is the prerequisite for its skirmishers. Urban fighting calls for light infantry. What has been diagrammed moreover is a mobile formation that stays together advancing block by block. Other battle elements must

be fed in to do the staggered blocking that secures the forward fighting formations against being taken in rear. But they do not block in place. They deploy laterally in the same way, to search and clear.

Figure 2



Because the several functions are separate and unlike, unit armament and equipment have some variations. Unit H being the contact point and shield against hostile force moving in the street, it should be armed with at least two light machine guns, with other personnel carrying submachine guns or machine pistols. Grenades, rifles, bayonets, etc, would be as of little use to it as a gun that could shoot around a corner.

Of possible value, however, would be a lightweight sighting device that could see around a corner, in the manner of a periscope. For in street fighting, when men advance by hugging walls, because that is the safest way to do it, such an aid to observation could be a boon. An additional equipment, worth considering, is a convex steel shield to be fitted on the left arm, an implement highly useful to a skirmisher wiggling along a ditch or gutter or preparing for a crouched dash across open space. We could have used such a shield in the Normandy hedgerow fighting: in the end it might save as many lives as the steel helmet or body armor. Not for general issue, it is a special situation device.

The C units that do the flankward searching and clearing should be armed with machine pistols and hand grenades only, though a dependable handgun (which means other than the Colt .45) could also be useful. They will move more actively than the others and they will need to go light; such fighting as they do will be at close quarters, where the machine pistol is accurate enough. The grenades are not so much for fighting as for clearing doubtful areas unsearched, for example, darkened basements or bunkers. The present issue fragmentation grenade is much too light and uncertain for such work, though troops try to use it for purposes not to be achieved by a 25-pound satchel charge. That we have little or nothing useful in between is a deficiency in the arsenal. The hand grenade of only five years ago was no better than that of 1918 and the technic of grenading, rather than advancing, has retrogressed. A more lethal grenade is now in hand but much more needs to be known of its application to operations in housed areas.

The C units are not the reenforcement of the H unit, other than in extreme emergency where the formation as a whole is in jeopardy: they are too lightly armed for that role and their machine pistols cannot stop what light machine guns are unable to turn back. Also they move most of the time obliquely.

Where antitank weapons accompany the formation -- and they belong there to begin -- they find their place in the wave of S units, and are to be ready on call. Put with the forefront wave, their operators are more likely to be killed than to prove useful, due to the weights they carry. Thus far, nothing has been said about flamethrowers. Enough to comment then that they do not belong. They are almost of no use in urban warfare. The load is unusually heavy, to make any practical thrust with it the operator must unduly expose himself, and the life of the flame is so extremely brief that the weapon is more a liability than an asset.

With the S units should move, also, more light machine guns and submachine guns or machine pistols. Rifles and grenade loads, except as the supply element in the S unit keeps feeding the grenade to the C unit, are not required weapons. That is to say that while it may be comforting and desirable to have a few grenades around "just in case," they are of marginal utility to the mission of the unit. It is the base of the small formation's operations and its main responsibility is to keep the advance energized by moving help and supply forward while reaching for contact and for help from the rear.

Wave S may be, as to men and weapons, from double to fourfold the strength of Unit H and Units C together. It is the main body of the formation's tactical sweep. Without a doubt, the infantry element is the lesser part of it and larger contingents of combat engineers belong there. Either there is such a mix, or there is no preparation for the likely contingencies. The overrunning of a built-up area is seldom

if ever exclusively an infantry task. It calls for all-around collaboration by the combined arms, though the artillery should have a lesser role to begin, should it be decided that heavy bombardment will not achieve the object. Heavy preliminary shelling does not greatly assist the penetration of a defended city, though it is often over-employed toward that end, as in the prolonged siege of Madrid from 1936 on. Serving warning, it drives the defenders underground. It does disrupt overhead communications (telephone lines) and public services, but unless the attack is pressed immediately, the defense is not materially disadvantaged.

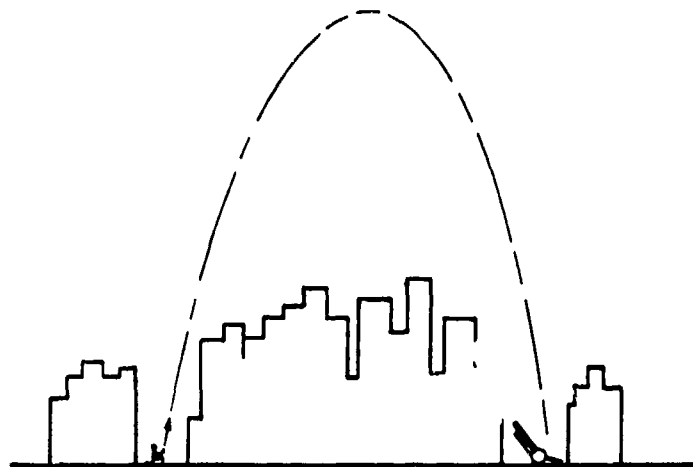
The engineering responsibilities with the task force of penetration are manifold. They include the improvisation of defensive works when the advance is halted, as usually happens with the approach of night, or as may happen when the forward element is stopped by an obstacle or impasse (for example, blown bridge) with which the infantry is not prepared to cope. The combat engineer contingent also handles major demolitions, repairs damage to rearward roads and other supply routes and tidies up forward positions, such action including the placement and removal of street barricades and the repair or replacement of wrecked bridges, etc. Hence the task force of penetration is but half-armed unless it is constituted as an infantry-engineer team.

8. OTHER WEAPONS

In addition to the weapons already mentioned, the S units in the attacking spearhead require an arm for high angle, short range fire -- arching fire over distance of not more than 200 meters. The weapon is to be used for firing over buildings against personnel concentrations or hard targets such as a battery emplacement. Its blast need not be sufficient to wreck the guns though the charge and fragmentation should be powerful enough to eliminate or scatter the gun crews.

In the taking of Eindhoven by the 506th Parachute Regiment in September 1944, the core of enemy resistance was organized around a battery of emplaced 88mm guns in the city center. The attack force had no organic weapons capable of engaging the battery by direct fire. The tactic that worked was to move up to within one city block of the battery and from street center, with the business houses serving as a shield, engage the guns with issue rifle grenades. Resistance began to dissolve when the first crew was hit and driven off. The grenadiers then sped around the block and eliminated the second gun and crew with line of sight grenade fire -- range about 150 meters. Resistance then collapsed and the 506th deployed at once to take over and hold the five bridges within the city.

Figure 3



True, the garrison was small. Equally true, the operation was a model of its kind. Not less true -- the decisive hits were flukes, brought about by guess and dead reckoning. A missile with more blast and greater lethality than a rifle grenade would better serve the purpose in block to block fighting -- something in the nature of a projector-type weapon or an adaptation of the trench mortar. The same weapon might be useful in signaling and target-marking, though if it is to be of service in movement through built-up areas, the smokes should send up a plume that stands higher than anything we used in Vietnam.

9. SPECIAL CONSIDERATIONS

The role of armor through phase one and up to the time when one quadrant is brought under firm control is mostly limited to:

- a. troop carrying up to the perimeter of the engaged area,
and
- b. demonstrating, patrolling and engaging hostile forces in the outer circumference.

Thereafter its employment depends on whether the tactical opportunity is present within the close combat zone.

For efficiency as well as for security, artillery is better based well outside the environs of the built-up area, unless a race track, city park or some other relatively cleared space is taken and secured in the course of the attack.

Along with garrison points and arsenals, radio and television stations, waterworks and other public utility plants are primary objectives of operations. The list, however, is much longer than is here indicated and the priorities will vary according to how the urban area is structured, whether its population is friendly or hostile and so on.

Planning should perforce include arrangements for the concentrating of hostiles, aid to neutrals and use of humane facilities, hospitals, ambulance services, etc. These are the missions of the police, medical and supply services.

Fighting operations, other than defense, should cease with the fall of dark. Perimeter defense, based at street intersections and protected by mines, wire, etc., offers the best prospect.

It might seem at first glance that there would be extreme exposure and undue jeopardy in this night placement of the frontal forces. Such is not the case, however. There is relatively more security for personnel than in the defense of a perimeter placed in open countryside. The position is not flankable. If a night attack is to be pressed against it, it might come straight on from any quarter.

Heavy bombardment by mortars, AT guns or other heavy weapons is a danger. But here again, the protection is better than on an entrenched hill under the same kind of attack. With the beginning of bombardment from any direction, the garrison moves out to the protection of the walls along the flanks, as in the following diagram.

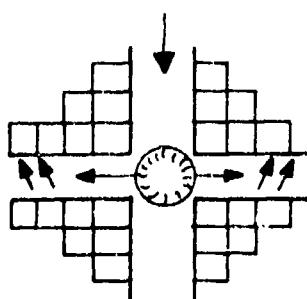


Figure 4

The shift starts promptly with the exploding of the first heavy round in the vicinity. That should be the drill: it would be folly to wait until movement is compelled by an intense concentration. All weapons move flankward with the men to just beyond the edge of the fire slot. Enemy skirmishers will not come through their own fire. The position can be resumed as promptly as the fire lifts. Reforming should be possible in less than one minute -- more than enough time to ready against the direct assault that may follow the bombardment. Should the assault be led by armor, the position is still tenable if the perimeter has been soundly located and then properly organized. Its security should not be permitted to rest on the weaponing at street level. Lacking depth, the position takes the utmost advantage of height. In sum, the choice of location should be such that night observation can be conducted from the upper stories or roofs of structures overlooking the approaches to the perimeter. The crews with tank-killing weapons should also be thus placed. The use of infra-red is therefore clearly indicated, for while the observers and AT personnel are out of the line of fire, they can see no farther after dark, as to movement in the street, than troops at ground level. The use of flares and other pyrotechnics from both the OPs and perimeters is no less plainly indicated. There is no more valuable adjunct to night defense. The U.S. Army has nothing now that will serve in the absence of field guns and mortars. The requirement is something by way of a rocket that will range up to 200 meters and give off bright light that will last up to two minutes. If it can be employed without a launcher, so much the better. We had such star-shells in World War I; they were subsequently obsoleted.

Some attention might be directed to the development of chemicals that when projected will temporarily paralyze or heavily discommode the people in a limited area. They would be useful in block-to-block operations, not so much to facilitate a leap-forward as to dissolve a concentration that threatens and cannot be reached by any missile due to obstructions. This reference is to disorienting and short time disabling chemicals or some of the vesicant gases.

Ever since World War I the British have possessed a smoke (or the secret thereof) that will cause acute toothache in every jaw, the intense pain lasting for a number of hours.

There are also available vapors that will put inhalers to sleep, not permanently, but for enough of a nodding period that on waking, they will be groggy for a fairly long spell.

In the late 1950s the Department of Defense commissioned a special panel to make a detailed study of the military properties of such drugs as LSD (then procurable from only one firm in Switzerland) and mescaline. The conclusions from the testing were that when projected as a vapor and then inhaled, such substances quickly disarranged military organization and made it incapable of effective response. In fact, the

effect on the group held together by a common discipline was more acute than on individuals with free will. There is good reason to believe that such vapors would have been useful in neutralizing citadel resistance during such operations as the 1968 siege of Hue and the 1972 siege of Quang Tri. But no such attempt was ever made. After the study was completed, the panel was graciously thanked, the report was filed away somewhere, and the subject has not been mentioned since.

10. MEN VERSUS ARMOR

In block-by-block urban warfare, armament and action should develop out of the proposition that disabling a large number of tanks is more important than killing a lesser percentage of them. The immobilized armored vehicle may (1) block a rightofway, or (2) create a worthwhile soft target as personnel collect for its extrication, or (3) become a solid protective barrier and shield for forces in the attack.

Toward better insuring perimeter defense, or for hasty use during skirmishing, an AT mine that will detonate under heavy pressure should have utility. But it should be shaped more on the order of a Bangalore torpedo, only flatter and longer. Since the less obvious it is, the better, camouflage technics in connection with the laying of the weapon should attend development.

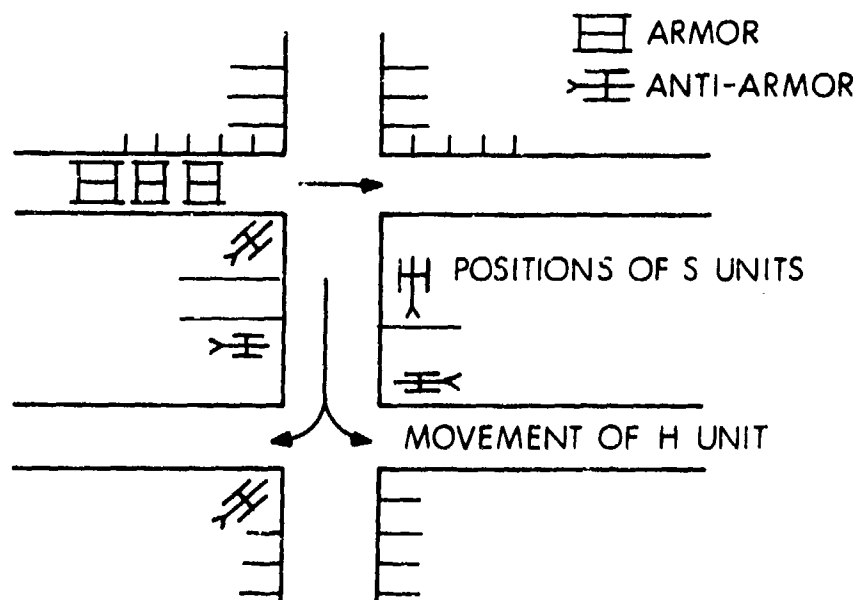
The latest, electronically or otherwise guided, manhandled missiles designed for field employment against tanks over ranges at which armor itself engages armor, are not likely to be of more than marginal use during fighting within cities. The tank or APC in such operations should be engaged most of the time from the flank or rear. Hand-carried A. weapons, such as the bazooka and Gammon grenade, or more specifically the same idea upgraded, better fill the bill. Tankers fighting in city streets are like tankers operating in heavy bush. The foreshortened horizon cuts their effectiveness by half. When they are taken under fire, claustrophobia intensifies, and their fears about situation become phantasmagoric.

Therefore when men afoot engage tanks at close range, surprise is important above all other considerations.

Figure 5 is to be coupled with Figure 2 which showed how the H, C and S units deploy during penetration and how they relate to one another in action. The object of the diagram is to show how units within the formation counter maneuver on getting the information that an armored formation has been seen or heard approaching their forward operating base. In the diagram the threat is from along the street to the flank. The SOP would be the same if the counterattacking column

were coming head on. The assumption is that it could be tanks or APCs and since it has not opened fire, it may be on reconnaissance and unaware that it is about to be engaged.

Figure 5



The H unit at the point, being armed only with light machine guns and machine pistols, does not fire or otherwise give away the position even if the vehicles are unbuttoned. It withdraws to the cover of the next street to the rear to be of possible use in the next stage of engagement.

The AT people and their weapons from out of the S units deploy forward to become the front element and to take up positions, preferably behind wall cover, using windows and doors for fire apertures, along the sides of the defile as here shown.

The point is now AT armed and the leader of the S units' AP people is personally at the pivot of action and decision. But it is not his committed purpose to draw the enemy vehicles into the AT fire gauntlet.

He must make that decision as the enemy force comes up. If the column continues on the same axis and it appears to him that it is too strong to warrant engaging, he may decide to let it pass. Then if it moves on, the formation returns to its former alignment.

On the other hand, should the enemy force turn right, he has little choice other than to engage. In that event, the fight is on when he fires the most forward AT weapon, though he waits until at least two of the armored vehicles are broadside to the other AT positions.

The numerous possibilities and opportunities that arise from any meeting engagement, especially when one side achieves the surprise that comes of immediate reaction, are inherent in this kind of fire exchange. The situation of the engaging infantry is by no means defeated or desperate, even should the AT weapons misfire and fail in trying to stop the armored movement. Armor is not built and armed for such action and it is more than half-blind to anything off its flank at street level.

- For the forward firers, there is always the wide-open chance to retire via the back door, or the halls, stairways and rooftops of the immediate surroundings and, in time, either rejoin the formation or get away to the main body. But the Army has never looked at the situation and problem of the soldier so positioned, though the soldier should not be thought of as a figure on a chessboard. What, for instance, do we know about the use of weapons from rooftops in urban fighting?
- The armor, if hit but not stopped, may back off, out of shock, due to the fire threat, and because of lack of information about the depth of the gauntlet.
- A few brewed-up hulls among the armor could block the defile and give the supporting infantry and engineers a plated shield, from behind which to continue the fight.
- Once the front of the armor becomes stalled, there arises the chance to circle the block and hit the rest of it in rear before it can get in motion.
- The H unit can strengthen the block by seeding the street with the Bangalore-type mine.
- If the armor stays buttoned, it cannot engage under these conditions. If the hatch is opened and manned, the vehicle is vulnerable to small arms fire and fire-bomb grenading.
- Most of what has been said about the tank will apply to at least one other armored vehicle, the APC, though not to the half-track.

The APC will not be of main use to forces of the attack other than for the ferrying of troops to the perimeter. The vehicle is not suited to fighting operations in built-up areas. The silhouette is too high and instead of affording protection to soldiers, the machine has the nature of a trap. The APC is mainly a shield against artillery fire and that is not the main danger in street fighting. For the forward fighting echelon, the utilitarian vehicle would be on the order of the mule or the dune buggy. For running ammo up to the point of contact, an even smaller and lower motor-driven vehicle could prove useful.

Admittedly, most of these considerations are on the optimistic side. What needs to be emphasized, however, is that the full range of tactical possibilities can be explored, described and anticipated. The means of contending with them, as to movement, reassembly of the formation and continuation of contact with the rear, are subject to reasonably realistic analysis and formulation. Group testing, and experiment under night and day conditions, will add dimension. The great difficulty in night ops is the maintaining of tactical coherence under stress. The average soldier can identify by voice only from two to five persons. In consequence, when the group gets scrambled under the pressure of fire and action, getting it sorted out again is the devil's own job, and is many times impossible. The more protracted the mixup, the more certainly will its average person begin to feel something akin to panic. Yet re-grouping has to be achieved before effective action can resume. The problem is not peculiar to urban warfare; it is no less acute in field operations. But the Army has not begun to move toward a practical solution; and there must be a better way than present hit-or-miss lack of method.

To look at what is needed in new arms, implements, equipments, etc, for operations in built-up areas is only half enough; and in war half enough is never enough by far more than half. The geometric, man-made and structural limitations and confinements of fighting in streets and through houses are in diametric contrast to the requirements and aims of operations in the open field. In the latter, the possession of commanding terrain features and objects restrictive of, or serviceable to, forward motion, such as bridges, causeways and railheads, are all-important. Of these come mobility; and superior mobility wins wars because it wins ground in the opportune hour and thereby facilitates the positioning of superior fire power. Terrain has comparatively little bearing on success or failure in city fighting. The possession of the highest hill may prove meaningless because observation is blocked where the first row of buildings interposes and the decisive fighting may be going well beyond that sighting. In the attack, mobility by any element is less important than the overall concentricity of operations. It is because the principles of war apply quite differently, and their balance is unique to this one manner of warfare, that tactical study and trial should progress parallel with suggestion, analysis and development in the realm of materiel. When mutually the one guides on the other soundness in operations is best insured.

11. URBAN AREA DEFENSE

Then what about the defense, bent on checking the penetration, then turning it and ultimately winning the battle and doing so with economy of force?

Toward further clarifying the thinking behind this report, several propositions need to be stated:

1. The warfare under consideration is nonnuclear.
2. In the age of air power and of the missile-armed field army, it is inconceivable that any battle for a city will be fought through street by street, district by district, to the finish. The issue will be decided well before that time by the intervention of air bombardment and the most destructive heavy weapons under the control of the field army, according to which side has command of the air. The fighting will end in the retirement or capitulation of one side well before the city can be half taken or, on the other hand, wholly re-won by the defending force.
3. At the same time, in certain cities, the fighting will be protracted, and its outcome particularly decisive. Such cities are in the category of "main bases," either because of their industrial complex or their milling of natural resources from which derives war power, as when the planning of Overlord was targeted on the Ruhr. Port cities -- both ocean and river -- usually are in this category.

That armor will be employed in the defense of these more vital urban areas is altogether likely, and along with armor, self-propelled artillery, if only because gun crews working in the open are less confused and more efficient than armor when working within the confines of a built-up area. The decisive combat arm of the defense, still will in all cases be the infantry.

Whether or not supported by armor or artillery, however, the infantry in counterattack cannot be expected to advance via the street or boulevard, once the battle is well joined. That would be the costliest way to engage, due to the fact that street pavement, sidewalk and the flanking walls (in Europe, usually stone or brick) double the shock of volume bullet fire, both as to wounds and noise, because of ricochets. This is less than a minor nuisance in field warfare.

The defending infantry therefore may be expected to come on through alleys, via backyards from house to house, and over the rooftops, where the front of the street is of joined business houses. Most of the time the best path of advance will lie between the facings of a city block. In residential areas usually the rearward fences or walls are low and the yards are treed or hedged and well cultivated. In sum, they provide limited cover.

Here we have the curious contrast that the penetrating force must advance via the lanes along which wheeled traffic flows, thereby to stay collected as well as to energize the attack, while the resistance must move laterally to conserve force and because it is in other respects tactically the soundest way. The probability bespeaks the need for the posting of individual flankers by the attacker to give warning of counterattack. This would include the positioning of observation posts in upper stories, rooftops or wherever they have an advantageous overlook.

The configurations of cities are as various as to the locating of sensitive points, high ground, natural barriers that may be fortified, etc, as is their number. Consequently, the general plan of city defense is according to its natural features no less than according to where lie the vital points requiring protection and how run its surface lines of communication. There is no common pattern, though a city map should reveal where the likely nodals of defense are located.

In general, however, the set defense of an urban area would be expected to organize around these several controlling ideas:

1. Close guarding of sensitive points.
2. Motorized recon patrolling of the outer perimeter.
3. Road-blocking of the main avenues of ingress, including rivers and canals, with foot detachments ready to deploy around AT weapons.
4. Placement of the command HQ, communications center and the tactical reserves in the most secure locale at the farthest distance from the indicated threat, provided that same is approximate to the most secure and serviceable avenue of retirement. Geographical and demographical factors determine that much of the time these two requirements can be met.

Yet when they are thus set forth, the disruption or destruction of the urban area command and its immediate attending forces becomes clearly the task of air power rather than of ground combat arms, including its armed air element.

When the attack forces come to control one quadrant of the defended built-up area, their point is practically at city center. But their main weapons are still remote from the nerve center of the resistance. For their own support aviation to divert to a strategic objective of this kind would mean not only the enervation and de-energizing of the attack at exactly the wrong moment, but a likely irreparable loss, since the target area is probably served by the strongest AA defense anywhere in the region. Nothing but the balanced use of all weapons is the best surety of success.

The defender cannot have an extended front unless the city is bisected by a fairly wide and deep river or canal, a condition frequently to be found in Europe, and sometimes in the United States. In the event that the defense is organized along a water barrier, with nodals of resistance built up around the bridgeheads, the axis of advance logically, and when the terrain and the street mosaic of the city so permit, runs generally parallel to the stream, so that thereby the MLR may be rolled up from the flank. The situation does not necessarily call for attack on a single front. In fact, the movement is greatly advantaged when there are converging axes of penetration as in Figure 1. Not only is resistance to the secondary attack likely to be less, but it will probably rely mainly on the more mobile elements of the defense. The dual attack is of greatest advantage because it best assures an earlier establishing of a firm lodgment and the securing of a practical operating base within the solidly structured center of the city.

From this line of reasoning, it must follow that the attack on the secondary line of advance is pressed by the more mobile elements of the army. The roll back of the more static, or in place, defenses, along the stream line is carried out by deployed infantry. The physical situation should in most cases permit direct support by the artillery and the requirement that the heavy engineering elements of the attack move close behind the infantry assault should be fairly obvious. The blowing of bridges by the defense as a last resort gains little time for its forces when amphibious tanks and other vehicles, along with transportable bridges, follow the assault waves.

Other than in the kind of situation heretofore described, it is precisely because narrowness of front will be the rule rather than the exception in urban warfare, which limitation will affect the forces of the defense and of the attack more or less equally, that engagement with fire will be predictably episodic and brief. While fields of fire will vary and may at times have depth, they will very rarely have width. In the employment of bullet-firing weapons, especially the LMG, it is more important than ever that volume fire be kept low, opening practically at pavement level, then moving higher when shown to be expedient. Though the short-frontedness of urban warfare may seem like the ultimate frustration to the tactician, the point-to-point nature of the struggle does tend to equalize it far more than in open warfare -- this, irrespective of the numbers in the immediately contending sides.

The controlling tactical idea should be to present the smallest possible target while producing enough fire to block the approach. That calls for vertical as well as street level organization of the position. Mobility still pays off, but in contrast to operations in the open, it is in localized form.

Success is with the side that retains the initiative, and while staying fully aggressive, makes the most accurate use of its fire power, keeps its combat elements tied-in from front to rear, and is

ever vigilant about security. Reference has already been made to the use of street and avenue intersections for protection in night defense, where there are close-by covering structures to the flanks. The traffic roundabout, which is a quite common feature of the European urban scape, is an even more suitable site, provided it is not too expansive, many-spoked and rimmed with manorial dwellings offset from the street. Then it may become a deadfall for small forces in the attack, while at the same time presenting a major rallying ground to the defenders, if mainly for the reason that their reserves are more likely to be close at hand.

In the defense of any considerable built-up area, the maintenance of a reserve is not only an important point, but almost an imperative. When the defending garrison lacks an adequate reserve, disengagement and withdrawal become next to impossible. When employed with that object in mind, the reserve should not be drawn up directly to the rear of the deployed and engaged elements that are about to break off the battle. They should be displaced to whichever flank affords the best opportunity for their break-off and retreat at least cost. That way, as the attacking forces advance, they will be threatened from the flank, and in their counter-maneuvering will lose their momentum. The only object here is to delay and not to renew the battle.

12. COUNTER MANEUVER

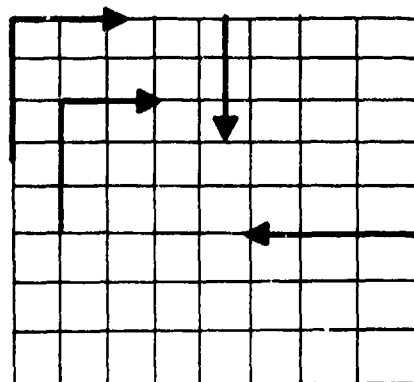
As to the defender's overall counter maneuver to the tactical plan of dual penetration, he would not likely be positioned in such strength at either point of attack as to blunt and turn either blow initially, and much less defeat both. Even to attempt it in the opening stage would hardly be to his advantage, because the repulse would be indecisive. The better tactics are to fight delaying actions where possible with relatively light force.

Then as the penetrations continue to extend, the defender will make his estimate based on the following considerations,

1. which flank of the penetration is the most direct threat to the city's most vital installations,
2. which attack column is the most vulnerable, due to its own organic weakness, or because of the flankward approaches, and
3. which could best be counterattacked at least risk of getting the forces of the defense situationally compromised and out of balance.

The decision made, the defense groups and maneuvers to hit one attack column in flank, doing so on a broad front. That is to say the tactical forces will attack over several avenues of approach. The figure then becomes something like Figure 6.

Figure 6



For the flank under counterattack, if the enemy cannot be stopped by halting in place, facing right, and roadblocking while calling in air and artillery support, the self-apparent alternative is not to withdraw along the axis of advance but to give way left and then right to support and reenforce the other arm of penetration. The counterattack force cannot continue the assault very far without risking becoming cut off and enveloped.

If on the other hand, the defending garrison is not in sufficient strength to counterattack effectively against the other flank, the tactical picture changes radically and becomes something like Figure 7.

As the forces in the attack start to compact under the pressure of the counterattack, there is a leftward shift of pressure in the attack as a whole. It is no longer a two-pronged advance, the battle's development having presented more favorable opportunities. Advance on the W-E axis is reenforced and pushed to intercept defending forces. Attack groups from out of the consolidated salient move into the lower quadrant heretofore not under direct attack, the indications having become that it is not strongly defended.

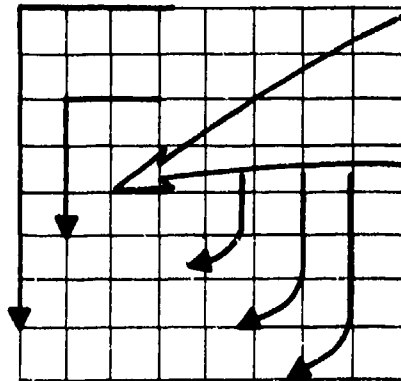


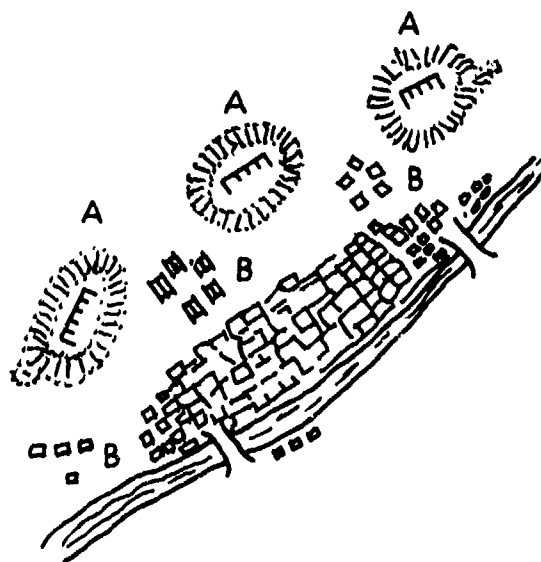
Figure 7

Another conceivable form of urban defense is according to an adaptation of the hedgehog principle. That is, that the holding of the city will be confided to the protective elements of an outer circle or some arc thereof. This is most feasible when the terrain features particularly favor it and is the more workable when heavy weather fastens its grip on all operations, such as the onfall of winter or a season of heavy rains. The added friction from such natural change does not fall evenly on the forces in the attack and of the defending garrison. The advantage of interior lines then most heavily favors the defender, both as to the movement of his vehicles and the well-being of his people. His rearward lines of supply are likely to be more dependable. He can bring up more easily what is needed, say, for winterization. Being solidly based, with protective and warming cover close at hand, he can rotate tactical forces so that those in the forward area do not suffer prolonged, undue hardship.

The roughed-out Figure 8 indicates the nature of such a defense. The city is covered forward by three fortified hills, garrisoned, fixed with solid works and possibly served by protected lines of communication to the main supply base and command center within the built-up area. The river barrier covers the rear and the lines of communication with other main force. In the in-between belt where there is open country and radial highways that cannot be interdicted by fire from the A-arc of fortified hills, the B-mobile elements of the defense -- armor and

armored infantry -- are ready to move to the gaps as needed. They will have the protective fires of their own artillery, also emplaced in the open, outside of the city environs. They can also be used to run reinforcement to the A positions when the fighting pressure so requires.

Figure 8



But the conditions thus imposed on the forces of the attack are not those of urban warfare. Their maneuvers toward decision are not unlike those of open warfare, and the more mobile elements -- tanks and APCs -- must take proportionate risks. The battle will be won or lost before there is fighting inside the city.

Furthermore, decision in the battle will almost inevitably turn to the side that is strongest in armor, provided it makes superior use of its mobility.

Even the best fortified city can be bombarded by the long-range artillery of today without the attacker being compelled to sit down to a proper siege. To the fire of long-range flat trajectory guns can be added the bomber attack at such altitudes that AA artillery and aircraft itself are no certain counter to it. The same must be said of the SAM. The outer arc of forts at a considerable distance from the city cannot save it from such bombardment or ultimately hold off

the direct attack. Rather, they in fact offer the most favorable targets to the attacking artillery. The stoutest reenforced concrete and armored turrets at the disposal of the defense cannot withstand the effects of heavy high-angle fire. They will be destroyed in relatively short order, and thus cannot prevent the attacker from gaining access to the city.

The fortress long since ceased to serve its true function of being a safe depot and center for war materiel, as well as a defense for important strategic points. Antwerp, the strongest fortress in Europe prior to World War I, held out for only twelve days. Singapore, in World War II, was taken practically according to the stride of the conquering army. Metz held out only a little longer. Verdun in World War I was no exception. Being a sector of the Allied front, it could not be isolated, and in the end it was not the forts that saved Verdun.

13. NIGHT OPS -- IN EXTENSION

Though the Army in the attack is ill-advised to undertake night operations within the structured city when its people are strangers to the region, that must be regarded as only a general rule to which there are several exceptions.

1. When it is fighting in friendly country and is assisted by friendly guides who know the lay of the city well enough that their directions may be trusted, the disadvantage is not so much removed as minimized.

2. After forces in the attack have been operating within the built-up area for such time that their individuals get the feel of the situational problem, and the power of the attacking army is obviously in the ascendant, there can be an extension into night operations without disproportionate risk.

In the defense of cities, there is no such limitation on operations. Provided the forces of the defense, or a considerable portion thereof including the leaders, have been there for such time that they feel relatively at home in the environment, there is every advantage in night operations, though it is not without pitfalls.

An example is the battle for Jerusalem in 1967. The Army of Israel had held and secured one-half of the city for almost twenty years. It knew the other half of the city from direct sighting over distance and from map study. The same may be said of the Army of Jordan which held the other half.

Shooting, that is to say, the exchange of fires, started in mid-morning, and was initiated by the Jordan Army. Until then, there had been doubt as to whether Jordan would enter the war.

Army Israel decided to launch the attack-in-main at night, employing armor, supported by paratroops moving in halftracks. The task force was well supplied with maps. The plan was based on almost exact knowledge of enemy strong points. Even so, the hitting elements made one false turn, in the dark mistaking one street for another, and the error proved very costly.

In night fighting within cities where infantry is the main element, the scrambling of forces with resultant confusion to operations (due to the difficulty of sorting out troops by voice identification) is a lesser hazard than in combat in open terrain. In the latter situation, the scrambled unit may become virtually leaderless, since the leader cannot be identified amid the babble, the noise of battle and mounting fear. It is then fortunate if it can even find the trail back to the line of departure.

In city fighting at night, zones of fire are restricted, and lines of advance and withdrawal are pretty much canalized by the street, the boulevard, a river or canal line, or a rail rightofway. There can be a predesignated re-assembly point, such as "two blocks to the rear," should scrambling and loss of coherence occur. This should be part of the SOP. And here is a situation where the leader should go first so that men may reform on him, provided he has left word with others that his action and intention must be spread about. In common sense, he need not nose around for his chief subordinates to get it done, provided his own instructions are plainly put to a few men in a moment of emergency.

An SOP could be worked out to solve this same tactical problem in open country fighting. Any number of workable solutions come to mind. Take this example. The leader throws a red flare 30 meters to his right. His men know this means he will displace an equal distance to his left and platoon leaders will align behind him at five or so meter intervals. There is no exactitude in such matters. What needs to be pointed out is that nothing but the beginning of re-collection can bring about the re-establishing of order in the battle formation. To that there need be added only that there must be technical solutions to the problem of maintaining identification in night fighting that we have not even sought. Unlike the larger problems of life, the main problems in minor tactics, once grasped, are subject to practical answers.

14. THE WALL

At a recent symposium on the problems of urban warfare -- and the conference had an international attendance along with a research analyst-military practitioner base -- some of the most experienced discussants related what they had learned from being at grips with the reality.

Included were commanders who had fought at Hue, South Vietnam, in 1968, or gone through Germany in 1945, and had done city fighting in Palestine over a number of situations. A brilliant Englishman, with some experience in war, also made some pertinent observations about what they had said of their operating problems.

The operators -- and they were objective realists made so by fighting experience -- accented the need for a projectile that from one or several hits would blast a hole in a stone wall, quite a few inches of concrete or a reinforced house of brick so that men may move through the hole and neutralize defense within the structure.

Their descriptions were graphic. They knew whereof they spoke. But they had operated within hamlets, towns and villages where forces were relatively limited in size and the built-up area, while resistant, was low structured, not subject to bypassing and not to be temporarily neutralized by some crippling agent that the attackers had in hand.

Though they agreed remarkably that they had had like experiences, that did not ipso facto make them typical. What happened to them is not the average, foreseeable problem of the attacking group in true urban warfare. There should not be envisaged a house-to-house advance in which resistance is eliminated mainly through heavy blast impact by missiles that can penetrate stone walls. The object is not to destroy enemy-held houses or to blow down walls with artillery; rather, it is to insure main opportunity for one's own forces in the attack or counterattack. Rarely will armor be moving with the point forces; rarely will artillery be capable of supporting them in any meaningful way.

These then are the materiel needs -- a projector that infantry can carry, blast missiles that are light enough for infantry to handle and that can effectively shatter a door or penetrate the metal-shuttered windows of a house or larger structure.

A city is not a strong-walled fortress. Few of its integers have such character, though some modern banks, government buildings and police posts have such an appearance. The city is vulnerable. The attack upon it should not be primarily concerned with projectiles that will blast holes through stone walls. The smaller missile that can penetrate aperture cover and explode inside makes better military sense than one shell that can open a wall or one bomb that can blow the building apart. A few such hits in the interior of a structure used as a resistance point will as certainly unnerve the defenders and bring about the desired result.

Blowing down walls when buildings are designed so that they might be entered and used is going at it the hard way. As General

Scharnhorst put it in his clumsy fashion almost two centuries ago: "In attacking a town, the infantryman should carry along an axe in case he may have to break down a door."

15. RUSES, SPECIAL OPERATIONS

Not to consider the possible tactics that may be used against U.S. forces either in the attack on, or defense of, urban areas, would perforce leave unsaid anything about possible effective counter measures and the materiel essential thereto.

Deception, such as the masking of forces in the attack as in the preparation of ambushes, is a potential to be anticipated. A general characteristic of warfare anywhere, and in any age, it is the more decisive when it takes a novel form for which the other side is not materially or morally prepared. Operations in Vietnam and around the Palestinian Middle East are in point. When the enemy is not immediately identifiable, and when he does not hesitate to violate the laws of warfare, through the instituting of terroristic practices, the use of non-military attire and the casting off of every human consideration, there is consequent confusion to the side that out of moral precepts, training and discipline abides by the conventions.

The employment of the guerilla swarm in or around the city proper, and on the largest possible scale, is not simply an imagined deception; it has been done in the past. The guerillas may be irregulars, or on the other hand, they may be line soldiers wearing the civilian garb of the area. They would likely be moving in the commercial vehicles common to the region -- milk trucks, grocery vans, mail delivery cars, etc. There are no outward signs of armament. Except for the driver, the vehicles may appear to be empty. The weapons are also concealed, but are ready for instant use. The object of the guerilla swarm is to close on the opposing position unhurt and unchallenged by appearing inoffensive.

Obviously the movement must be stopped before it has traversed the approach. Would a trained military force, out of uncertainty, withhold fire until all the advantage of distance has been lost? It happened numerous times in Vietnam. Positions were lost and people were killed because of doubt about identification. This also took place too often when the movement was by foot.

Or consider another strategem. The city population may be either neutral or hostile to the defending garrison. The tactical forces of the latter will nonetheless in either case use these people as a screen and buffer, driving them on ahead to absorb the opening fire, if it comes. The friendly forces witnessing this phenomenon may well recognize that they are being confronted with a military movement, but

still will hesitate to fire. For these are tortuous options: either slaughter a civilian mass, or chance being overrun. If the friendly force possesses none but lethal weapons, there is no other alternative.

Each of these problems is a true dilemma for the decision-maker. Neither tactic is the product of a fertile and enfevered imagination. Both were employed by the Red Army in 1941-43, chiefly in the Ukraine. The documentation is to be found in U.S. Army intelligence files. When civilians were used for a shield, as happened in the Ukraine, the pawns were themselves Russians.

So certain questions arise, since the possible threat cannot be dismissed as chimeric. Against these tactics of confusion, are chemical agents -- that is, disabling or disorienting gases, vapors or smokes that would take immediate effect and persist for several hours -- the most proper and promising military solution? It is assumed that the target would be the moving mass as a whole, toward neutralizing and dissolving it.

If the answer to the first question is yes, then are such substances available? Do we have them in quantity? Is further development in this field needed? Finally, do public policy, political posturing and popular prejudice exclude their use?

The need for nighttime illuminated defense within the city, and of such materiel moving with and remaining available to the attacking formation, has already been pointed out. It has been said that what we have will not suffice that need.

Of possible value as an adjunct of the illuminated defense is a noxious, or nauseating, smoke. Though smoke is usually regarded as extra insurance for forces in the attack, it could be of equal utility to static night defense in urban warfare.

It is not possible logistically to make the illuminated defense constant and continuous either in open warfare or in city fighting. There must be still larger intervals of total dark. During that interim, in open warfare, the attacking skirmisher may move from one protected point to another. But these same points have become perceivable before dark closes. Fire directed against them may not hit them, but it becomes continuously more discouraging.

In urban operations his available cover as he bounds forward is ubiquitous, in contrast to open warfare. It is present in every doorway, every break or recess in the built-up sides of the street, as in any solid object in the street proper, such as monument, traffic control tower or kiosk.

Any smoke, even one that has no bodily effect, can be tactically disarranging, if it does no more than double the dark. A temporarily disabling smoke that would nauseate, or blind or disorient at tactical distance, would complement the other advantages of the illuminated night defense.

16. ROLE OF THE HELICOPTER

There is no reason to believe other than that the helicopter has a major role in built-up area warfare as the main transporter of men and supply up to the battle zone.

To begin, where there is dual penetration over two converging axes, the effect on overland supply lines is as during military operations within a salient. The more force that is fed into the battle and the more extended becomes the advance, the tighter becomes the logistical bind on the fire fighting. There must occur a gradual but steadily increasing pinch-out of road space until at last only a relatively few motor vehicles may make it to the point. The effect is comparable to what happens on radial superhighways serving a city during the rush hours of traffic. The closer one gets to his destination the lesser becomes the space for freedom of movement. In fighting operations, the movement of supply dumps up to the city perimeter does not materially lessen the friction. The congestion is worst next the impact area in the central city. There are ammo and other carriers coming in, while ambulances and empties are straining to get out.

After the facade of one sector of the city structure comes under control, the helicopter has an operationally safe shield against fire from deeper within the built-up area so long as it flies the nap. It can land and unload in the city street or parkway or in a backyard; it can hover and unload on a rooftop and next the slope of an embankment. During engagement, it can move up as close as the last bend in the thoroughfare just short of the fire fight.

For quick medevac and for relaying messages as a communications link between front and rear, it is no less indispensable.

Beyond that, how far the helicopter's various other tactical services to the line may be extended in urban warfare, it becomes difficult to see. Only a few actions in Vietnam, such as the 1972 battle of An Loc and the 1969 siege of Hue have provided a partway, though inconclusive kind of testing. So it is more of a speculation than an informed estimate when I say that the helicopter will be little used for target spotting and marking, for command sensing and directing of the battle from overhead, for turning enemy positions by landing troops on his rear, and finally, for engaging enemy troops at ground level with rockets, grenades, bombs and bullets.

Not only will there be less requirement for such services in the attack against built-up areas; the rate of attrition would in any case all but prohibit them.

So saying would seem to leave the major advantages of armament to the helicopters serving the defense. But it is not necessarily so, nor is it highly relevant, owing to the restrictions on the machine when it must operate under the conditions of urban warfare.

The deployed forces of the attack will have their overhead cover close at hand. The soldier pressed close to the wall will not be a fair target for fire directly from above. The helicopter can no more in the city than in the country slip up on foot skirmishers unannounced.

Night operations by helicopters using assault weapons may offer some possibilities. So might the pursuit of routed forces and sorties against patrols moving in the city environs. Otherwise, the gunship and its kind look to be pretty much sideliners during the battle.

17. URBAN AND SUBURBAN

In urban warfare proper, attack forces do not take up ground where either flank or the rear dangles in air. Refused flanks and rearward outposts lose any meaningful tactical value, as does headlong enterprise that takes no account of what its dash may do to chain-of-force operations. The defense, on the other hand, can afford to risk "staying loose" in the first stage of battle. Whereas to begin, the forces of the defense must "feel out of the situation," from the start to the crisis of battle, the key to success for forces in the attack lies in continued collection, of which come both control and greater security. The forward order of battle is correctly formed only when it is without a rearguard. Strictly speaking, it has no rear.

Tactically, the suburban area is likely to have a quite different military aspect than the city proper. Though usually most of the streets and avenues are narrower, there is on the whole more open space and seldom a central and concentrated cluster of tall buildings. Its passages are not prohibitive, since in general they lack the character of a true defile, and resistance will weaken and dissolve when there is an oncoming massive show of force. The approach in column is therefore by no means a reckless gamble.

These conditions then do not forbid the employment of armor and APCs, and indeed, sometimes highly favor it, the danger of compromising the force as a whole being quite limited.

When the driver can see well ahead and the commander in the turret can con right and left, the tank is not an inviting and vulnerable target in a built-up area. However, in suburban areas or nearby

countryside, armor in column must avoid exposing its flank to wooded areas and must exercise caution in approaching a hill mass or ridge crowned with cover of any kind. These are the likely sites of heavy weapons resistance and should be reconnoitered by patrols in light vehicles before the van resumes the advance or moves to within easy killing range.

As modern highways and other communication lines have grown in importance to the motorized-mechanized army, their key positions -- bridges, causeways, defiles and tunnels -- have become more and more the main objectives of battle, and have to be defended more powerfully. When bridges are destroyed, they have need to be rapidly repaired or replaced. The army that can repair and replace the most rapidly both gains an enormous advantage in time and further extends its radius of operation.

18. MOVEMENT AND FIRE

To be emphasized above most other considerations is the point that in movement against built-up areas the forces in the attack do not advance initially by fire-and-movement, but to the contrary, keep moving, then fire when so opposed and when there is some certainty about the target. Fire otherwise is a waste of ammunition that is better conserved, and is likewise a giveaway of the direction of the attack. In built-up areas, once fire is loosed without good reason by the point of the attack, or for that matter by any following element, the likely consequence is a shoot-off all along the column, death or injury to noncombatants and damage to nonoffensive real estate.

The problem of fire control along the length of an attack column that includes armor, APCs, various other vehicles of the support and supply elements, and the carriers that bring along the camp followers, has not been solved and has hardly been studied. Practically all elements are arms-bearing. Yet they are not linked together front to rear by radio. Some in fact are limited to voice communication. Yet only a little random fire from some vehicle in the column, or a few incoming rounds that do no damage, may touch off volume fire the length of the column. Every such wayward and extravagant action is as heavy a drag on mobility as the demolition of a bridge forward or an attack by a bypassed mobile formation on one's rear. Time is lost in determining what has happened or as personnel in open vehicles seek cover, thinking the column is under attack. An hour may pass before control and forward motion are restored. In this, as in most operations in war, the working of the economy of force principle is nearly absolute: it is not more important to trick the enemy into expending his supply uselessly than to avoid the wasting of one's own fire and other resources.

Hence when practicable, it is better to advance in parallel attack columns. So doing facilitates frontal extension, makes easier fire control from front to rear, and softens any resistance elements in

between by denying them a ready line of withdrawal. At the same time, twin columns are mutually protecting against counterattack from the flank.

19. MISCELLANY

- In urban warfare it is more important than in open fighting to drill into squads the necessity that adequate intervals between individuals be maintained. In all fighting, the tendency is for men to converge, and under extreme pressure, huddle. In countryside operations, the fighter gets a certain amount of protection simply by going flat. In street fighting, he is largely denied that, and is better advised to roll off to the flanks. When the group is so trained, it can re-knit tactically and resume collected action more quickly.
- The foot formation of the forefront in urban fighting should at all times operate with a reserve. Out of the reserve are supplied individual replacements when casualties occur in the forward array and also package replacements, or fire teams, to rotate forward when the people on point wear down. But the reserve does not stay idle and grouped. To further its own security, it deploys in defensive position to the flanks of the MSR. By so doing, its members will be better prepared for action forward.
- A much more complete system of arm signals will be required and should be prepared. The extraordinary tumult of street engagement will probably drown out command by voice in the crises of action, and there is a new and different range of tactical possibilities to be considered, for example, the vertical deployment of men and weapons.
- Overall communications within the built-up city environment will almost necessarily depend on radio only, using existing equipment and extending already proved technics. The RT and its operator will bear the brunt of responsibility. Jamming is not only possible but probable as is the enemy's use of the channel to give conflicting order and otherwise confuse operations, which was done infrequently in Vietnam from 1966 on. Suggestions as to counter measure are not within the competence of the writer of this report. Enough to say that dependence on telephone lines raises greater operational difficulties and engages like hazards.

- In inner city fighting, patrolling for the sake of recon, or to gather information about enemy dispositions, is likely to have little value and is most apt to jeopardize wholly the life of the patrol. Well-armed patrolling in the interests of provoking engagement forward of the ready-to-move main force in the attack, when the terrain along the approach affords the patrol fair protection, may contribute to the soundness of operations. Patrolling to the flanks to prospect for water and other essential supply as well as to extend the area brought under control should be normal operating procedure. Patrolling by night is hardly to be recommended in any circumstance. If the forces in the attack stay tied-in and are vigilant as to security, night patrolling will not be needed within the built-up city.
- The effectiveness of aimed rifle fire from upper stories against individuals moving at street level is hardly to be doubted. Dramatic, and most tragic episodes in the national life, such as those at Dallas, New Orleans and on the University of Texas campus have highlighted both the reality of the danger and the extraordinary difficulty of eliminating it. That one sniper could keep 200 armed, trained men at bay for 48 hours was not to be believed until it happened. These episodes, however, were not regarded as having any particular military significance, that is, of a tactical nature. How to make the best use of an issue high-powered rifle from a firing point on the roof of a high rise building or from the topmost balustrade in a clock tower are questions not pondered by the schools and arsenals and there are no experimental ranges of the kind needed for ballistics testing, surer knowledge of trajectory, etc. But since the law of gravity still operates, there must be some very special differences between firing on the flat and firing down at some degrees from the perpendicular. Is the M-16 a satisfactory arm for use in firing from the roof of an eight-story building against targets in the street? My guess is it would have some serious deficiencies. Is the M-60 LMG adaptable to any such employment? As presently fitted, it could hardly be used for firing downward. On the other hand, the M-16 was useful in Vietnam for firing at sampans from a helicopter in flight and an adaptation of the M-60 made it of practical employment for door gunners. Does such work call for expert riflemen or could the mine-run qualifier do it? There are many such questions, and if urban warfare is thought to be even a minor possibility of the future, we need to know more about the answers.

20. TERRAIN APPRECIATION

If terrain appreciation, as it is understood in open warfare, bears less directly on the possibilities of maneuver and operations planning in urban fighting than do other considerations such as the placement of utilities and reservoirs, it is at the same time more difficult.

Possession of the highest ground in the city may be wholly without value if it commands no entry port and affords no observation of the sensitive points likely to be strongly guarded by the defense. Any building will give the skirmisher better defilade protection against artillery and mortar blast than the reverse side of any hill, provided the building is three stories or more. On the other hand, warehouse cover, as such, is to be avoided unless it is self-evident that the contents are not highly combustible or explosive. There are few safer locations for a command post than the undercrofting of a stone-walled monastery or nunnery.

The tree-crowned hill or bluff that overlooks a main traffic artery, however, is no less likely to be the siting for artillery or the nesting of armor than in open warfare. And so is the forest covered park. Such an area, if otherwise favorably located, may be used as the assembly ground of the defender's reserve.

Generally speaking, in urban warfare, terrain appreciation is less likely to be of direct concern to the planners at upper levels than to the individual rifleman. To make the best use of his foreground, he must still determine, pretty much on his own, which natural or man-made object will best preserve him against blast and bullet fire. He must see where ditches or covering banks provide a margin of safety. Given a choice between exposure in an open lot or on the cobbled street when shellfire comes in, he must know that his best chance lies with the former. He needs understand that shadows will help hide movements, that open ground is an invitation to death when there is high rise beyond it and that an alley may be a safer approach than a street because houses are not structured to overlook alleys. But there are some fundamental differences between the need-to-knows of open warfare and urban warfare and he should not have to learn all of them the hard way, out of battle experience.

21. EARLIER LIGHT

In the brief prefatory note that leads this report it is stated that no recognized authority on the art of warfare has seen fit to write about combat problems and solutions in the urban environment.

Toward keeping his flanks covered, the author now makes mention that there is one exception, an obscure work titled The Military Field Pocket Book written somewhere around 1806 by the German General Gerhard J. D. von Scharnhorst. In 1811 it was translated into English by two junior officers in His Majesty's service and the yellowed pages of that edition are the final word. The Field Pocket Book runs 330 pages counting the maps and would well weight a large pocket. Of that number, seven pages are devoted to the attack upon, and defense of towns.

Under this general heading is to be found the instruction: "Water is to be kept everywhere in large vessels but particularly in the upper part of buildings.

"Carcasses are to be thrown upon the enemy when he tries to scale the building during the night.

"The garrison is to be distributed in the different rooms: a reserve is stationed in the middle of the house for the purpose of supporting the part principally attacked, and a party is on the roof armed with stones.

"Provisions and ammunition are the first things to be attended to.

"The roofs should be covered with earth and dung and everything inflammable removed.

"If a building is to be attacked without heavy artillery, an attempt must be made to surprize it by night, in order to prevent the enemy deriving the advantage he otherwise would do from his fire. The troops are to be formed in 6 or 8 divisions and the building is to be attacked from every side. Each division must be attended by some men with ladders and others with axes. Perhaps a sort of moveable penthouse may be made use of, under which the men may be sheltered from the stones above and the musketry in front."

One of the longer passages, paragraph 218, is titled: "To Put a Churchyard and a Town Surrounded by a Wall in a State of Defense and to Attack the Same." One of its noteworthy passages reads: "Fougasses in front of the entrance and under the barricades may be of great use." This same weapon, improvised on the battlefield, was used with terrible effect by the 23rd U.S. Infantry Regiment in the defense of Hoensong, Korea, in January, 1951.

On the importance of communications, there are these words: "If a bridge has importance, it is to be defended by a corps while the Army marches forward. Two strong redoubts should be constructed on one side close to the river. Higher up, rafts are placed in the river on which there are wooden breastworks."

There may be a question whether any of this will prove helpful but it was thought prudent to include it in the interests of scholarship.

22. THE UGLY CONNOTATION

The very name of urban warfare is unpleasant and unpalatable, and probably unacceptable to the American people, if not to their government. It could become as much so as was the name of chemical warfare in recent decades, and as repugnant to the masses as is the thought of nuclear war.

The killing of people in any circumstance is shocking enough. The killing of the wrong people out of a cold-blooded, but thought-through concept of what future war may require in the interests of survival, could become rejected utterly by the national emotion as war criminality beyond the pale. That history says that warfare in built-up areas is as ancient as history itself is not likely to palliate the reaction. The mass is no more interested in what history says than in what the study of human nature makes precitable for the future.

We are dealing with the basic fact that sensibilities are not always sensible and that putting the wrong name on a new theory of operations can have dire consequence. Press exposure, like public hysteria, is to be reckoned with. The pretext for raging against the military is ever being sought. Ideas, like actions, may be so provocative, as to bring on storms of protest, street demonstrations or marches on Washington.

Here is the second reason why the writer of this report believes that we should more advisedly think and speak of operations in built-up areas rather than of urban warfare.

Of course, to those who react with outraged indignation on hearing that the subject is under study, there is ever the answer, supplied by reason, that war is made, not fundamentally with the object of destroying life and property, but with the aim of so intimidating and inciting to protest or to rebellion, elements of the society that the ideal of the common defense will be abandoned, and their country, their homes, ships and other properties may be occupied or even possessed.

The attack on the civil will is no longer a might-some-day happen thing to the American people. We had it during the Vietnam years, undulantly, but with increasing virulence, infecting larger sectors of the citizenry, press and Congress toward the end. Unfortunately, it was a two-way lesson. The dissidents learned through testing, far better than was known before through experience in other wars, to what extremes American rights under the Constitution would protect the ends of subversion and the fomenting of social turbulence during wartime.

The lesson is not likely to be lost. Government, and the people as a whole, should have learned that the attack from without upon the civil will is hardest pressed in war whenever that will appears to be most lacking. It becomes at that point the most vulnerable sector of the national front, for eventually it must corrode and corrupt the fighting force. Due to the nature of our system, we have few direct defenses against it. The dissemination of enemy propaganda in the United States, 1965-73, was more active than in any neutral country. Throughout the country there was no lack of volunteer circulation managers and scarcely anywhere did they incur marked public disfavor. The media welcomed them. They were good show, good copy, which consideration was enough to justify cooperation.

The attack on the civil will, otherwise expressed, is psychological warfare. In the local situation, that is to say in urban warfare, as in operations in the more open countryside, it is also to be pressed in accordance with the principles of war, respecting surprise, concentration and the fixing of the objective, etc. The scatter-gun approach has failed our forces every time we have used it -- meaning all operations in the last three wars. The attack on the civil will should not be pressed until the object is engaged; it picks up momentum as the battle comes to crisis and then is turned on to the limit when success appears to be at hand -- this, to stimulate harassment of the enemy during withdrawal. Even neutrals, in the majority, though held in thrall by an alien occupier, will put personal security above every other consideration while waiting to see which is the winning side.

It is little different with a conquered populace, friendly or allied to the force that would liberate them. FFI operations in France, from the summer of 1940 until May on 1944, did no more than nettle the German occupiers. By contrast, from the hour of the Allied invasion of Normandy onward, they were of extraordinary assistance to the operations of American and British forces.

Leaflet scattering in the attack on cities is a technic better written off -- a waste of energy, money and possibly of lives. Showering tens of millions of pre-printed and probably out-dated pamphlets to do a job that a live voice on radio can do much better, with more explicit information and at no additional expense, is one of the more stupid military exercises. Moreover, out of redundancy and bad timing, it is usually self-defeating. Once set in motion, its main aim seems to be to smother everyone in the target area with deluges of paper. The message as to effectiveness is measured in paper tonnage, not valid proof of results. The only explanation in excuse of this phenomenon is that habit and long practice make it difficult to turn off wastefulness in any form.

23. CONCLUSION

There is an abundant literature that bears, unfortunately more indirectly than directly on the nature and problems of urban warfare. Its most renowned and attractive line of departure for the scholar is the ruinous face of Helen and the Wooden Horse at the siege of Troy. That Joshua did shake down the walls of Jericho with the blast of a trumpet is hardly to be doubted by anyone familiar with the somnolent town of today. There could never have been vigorous resistance in Jericho: the place is much too hot. Too bad that we do not know what the defenders did after the walls went down. It is that way with the literature on urban warfare as a whole. Most of it deals with shadow rather than with substance, with theory and with main command considerations more than with technics and with lessons learned.

All of this is because the men at the point of white heat are seldom interviewed and their personal experiences are rarely recorded in any detail. Urban warfare is regarded as an exception, an occasional and unhappy accident, far away from the main stream. War, when properly conducted, according to human superstition, belongs in civilianless open countryside.

Even so, the library on cityside combat operations is not without value. Such actions as Schmidt, Aachen, Eindhoven, Arnhem, Bastogne and the Canadian raid at Dieppe were recorded, and from what has been written, there is something to be learned. The siege of Jerusalem in 1948 is a story well told. The battles of Jerusalem and Gaza in 1967 are highly relevant and well documented. Less rewarding are the accounts of the taking of Inchon and Seoul in 1950, the U.S. recovery at Suwon in 1950 and U.S. experience in passing through the North Korea cities, where there was little fighting. There are at least eight city or town battles in Vietnam deserving of study and analysis. The information is to be found only in official documents, and what is there is skeletonized. But the sources are not to be despised for that reason. Bits of information come where one finds them and are never to be expected in spate. They are not such -- that is, the data -- as to complete a picture in the round. The mosaic of new war theory or a plan for future operations, now only vaguely glimpsed, is assembled out of learning as completely as possible what has been, and whereby success or failure was brought about, and then through extrapolation -- the application of common sense analysis combined with imaginative experimentation -- arriving at a measure of what the findings signify and the directions to be taken.

Every small thing learned is a step forward. More accurately put, it is something added to a safeguard.

FINIS